School of Physiotherapy

Syllabus

For

Master of Physiotherapy

(Cardiovascular and Pulmonary)

(SEMESTER: I to IV)

DELHI PHARMACEUTICAL SCIENCES AND RESEARCH UNIVERSITY

Physiotherapy in Cardiovascular and Pulmonary is a post graduate course which encompasses prevention, rehabilitation and restoration following all surgical and medical conditions contextualto the vital organs heart and lungs. This curriculum will facilitate professionally trained post graduates to independently analyse, interpret and apply self-directed Physiotherapy management skills in the fields traversing from Critical Care to Community and in all ages from premature neonates to older adults. These Post Graduates from the university will not only foster specialised health care services but will also be conducive to Equitable Social Environment and aid Sustainable Development.

Goals

- The specific goal of the educational program is to prepare individuals to undertake the roles of a Physiotherapist in India and abroad as well. These roles include clinical practitioner, communicator, collaborator, manager, advocate, scholarly practitioner, and professional. With critical enquiry and evidence-based practice as the foundation, our program promotes the acquisition of advanced academic knowledge, skills and behaviors that are essential for a primary health care provider in a complex and continually evolving health care environment.
- MPT Training will essentially include but not limited to academic teaching learning, practical exposure, patient management, administrative planning and research studies/projects. The studentswill have to regularly attend seminar, group discussion, bed side clinical assessment rounds and discussions, regularly attend clinics and present case, journal meetings and reviews and also other continued education activities.
- The Master of Physiotherapy (MPT endorsed) programme endorsed in one of the specialist areas (Cardiovascular and Pulmonary Science) aims to advance the student's clinical reasoning and Cardiopulmonary Physiotherapy management and skills beyond that of the entry level practitioner and provide one of the prerequisites necessary to achieve specialization.
- The School of Physiotherapy aims to provide students with a high level of knowledge and experience in order to help them develop their own research skills whether using qualitative or quantitative methodologies for statistical analysis, lab-based studies or community work, prevalence studies or intervention trialing – our aim is to have students complete their master's confident in their abilities to conduct research and assess relevant literature and practices, whether this leads to PhD study in the future or to more assured clinical practice.

Career Opportunities

- Physiotherapist with various Hospitals and Fitness Centres
- Physiotherapists practice in many private settings as well as Government hospitals
- ICU settings
- Defense medical establishments
- Private hospitals
- Private Practice
- Outpatient clinics
- Health and Wellness clinics
- In the rehabilitation Department.
- Sports events
- Health institutions
- In Multinational companies.
- Academics
- Research analyst in Research Centers both national and international
- Schools and Private homes

- They can also practice in non patient care roles like health policy, health insurance, coding executive and Health care administration and as health care executives.
- Physiotherapists are also involved in medical legal field serving as expert and performing peer reviews.

Objectives of the course:

- To create such Physiotherapy Professionals who work in such a system of decorum, either made by others or by themselves with a depth of knowledge to impart and apply that with experiences of work and can handle the cases of Physiotherapy in emergencies with in ICU and other critical care units also.

Practical Examination

- Practical examination which includes patient assessment, evaluation and management, viva–voce etc.

Research and Dissertation – 14 Credits

- Student will be provided with guide at the beginning of 3rd semester. Literature survey will be done by the student in the semester and if feasible may submit the title and the proposal by the end of the semester and candidate will work in the final semester and submit a written thesis in IV semester.

Practical Attachments:

- To enable the students to acquire practicing in hands on skills, maximum emphasis will be laid on regular practical classes, demonstration and clinical practice. The students will undergo Clinical / Field training in DPSRU Campus and other specialised centres/hospitals and organise community awareness programs and when required and decided by department of Cardio-Pulmonary. Internal assessment for practical examination will be provided on the basis of sessional examination and feedback and evaluation of the clinical/ field supervisors sent to the Cardio-Pulmonary Clinical Coordinator(s).

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
First Semester								
MPTC 101 T *	Advanced Human and Health Sciences (Including Genomics)	4		4	64	20	80	100
MPTC 102 T*	Applied Biomechanics and Kinesiology	3		3	48	20	80	100
MPTC 103 T*	Advanced Diagnostics and Physiotherapeutics	4		4	64	20	80	100
MPTC 104 T*	Research Methodology and Biostatistics	3		3	48	20	80	100
MPTC 105 T*	Value Added	2		2		50	-	50
MPTC 101 P *	Advanced Human and Health Sciences (Including Genomics)		2	1	32	10	40	50
MPTC 102 P*	Applied Biomechanics and Kinesiology		3	2	48	10	40	50
MPTC 103 P*	Advanced Diagnostics and Physiotherapeutics		3	2	48	10	40	50
MPTC 106 P*	Evaluative Clinical Practice- I** (Based on Viva, Case presentation of clinical postings)		15	8	240	50	50	100
MPTC 107 P* NU- I	Research Appraisal- I		2	1	32	50	-	50
	Total	16	25	30	624	260	490	750

Regarding Value added course in MPT 1st semester: Value added courses will be aimed at providing hands-on training, skills/ MOOC courses/ Indian or Foreign Language enhancement/ certificate course on personality development/ interview and administrative skills etc. to add value and enhance the ability and competencies and skills of the student. The subject will be of 2 credits. Weightage of subject will be 50 marks based on continuous assessment as scored in the ability enhancement hours in the semester

** Clinical training will be for 12 weeks x 4hours x 5daysand evaluated as Evaluative Clinical Practice- I

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
Second Semester								
MPTC 201 T *	Exercise Physiology	4		4	64	20	80	100
MPTC 202 T	Pulmonary Medical and surgical conditions	4		4	64	20	80	100
MPTC 203 T	Advanced Physiotherapeutics- in Pulmonary medical and surgical conditions	6		6	96	20	80	100
MPTC 204 T*	Elective- I (Yogic Science)#	2		2	-	50	-	50
MPTC 205T*	Elective- II (Machine Learning)#	2		2	-	50	-	50
#Students can opt any one elective subject out of the two								
MPTC 201 P *	Exercise Physiology		2	1	32	10	40	50
MPTC 202 P	Pulmonary Medical and surgical conditions		3	2	48	10	40	50
MPTC 203 P	Advance Physiotherapeutics- in Pulmonary medical and surgical conditions		3	2	48	10	40	50
MPTC 206 P	Evaluative Clinical Practice-II** (Based on Viva, Case presentation of clinical postings)		15	8	240	50	50	100
MPT C 207 NU- II	Research Appraisal- II		2	1	32	50	-	50
	Total	16	25	30	624	240	410	650

** Clinical training will be for 12 weeks x 4hours x 5days and evaluated as Evaluative Clinical Practice- II

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
Third Semester								
MPTC 301 T	Cardiovascular medical and Surgical conditions	4		4	64	20	80	100
MPTC 302 T	Advanced Physiotherapeutics in Cardiovascular Medical and Surgical Conditions	6		6	96	20	80	100
MPTC 303 T*	Computer Skills Programing Elective 1#	2		2	-	50	-	50
MPTC 304 T*	Clinical Nutrition Elective 2#	2		2	-	50	-	50
#Students can opt any one elective subject out of the two								
MPTC 301 P	Cardiovascular medical and Surgical conditions		2	1	32	10	40	50
MPTC 302 P	Advance Physiotherapeutics in Cardiovascular Medical and Surgical Conditions		4	2	64	10	40	50
MPTC 305 P	Evaluative Clinical Practice-III** (Based on Viva, Case presentation of clinical postings)		18	9	288	50	50	100
MPTC 306 P	Introduction to Research /Dissertation		6	3	96	10	40	50
	Total	12	30	29	640	170	330	500

** Clinical training will be for 12 weeks x 4hours x 6days and evaluated as Evaluative Clinical Practice- III

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
Fourth Semester								
MPTC 401 T*	Bioethics and Hospital Administration	4	-	4	64	20	80	100
MPTC 402 T*	Pedagogy Elective 1#	2		2	-	50	-	50
MPTC 403 T*	Entrepreneurship Elective 2#	2		2	-	50	-	50
#Students can choose 1 elective subject out of the given 2								
MPTC 404 P	Dissertation	-	18	9	288	60	140	200
MPTC 405 P	Evaluative Clinical Practice- IV** (Based on Viva, Case presentation from clinical postings)	-	18	9	288	20	80	100
	Total	6	36	24	640	150	300	450

** Clinical training will be for 12 weeks x 4hours x 6days and evaluated as Evaluative Clinical Practice- IV

Summary

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
First Semester								
Total		16	25	30	624	260	490	750
Second Semester								
Total		16	25	30	624	240	410	650
Third Semester								
Total		12	30	29	640	170	330	500
Fourth Semester								
Total		6	36	24	640	150	300	450
Grand Total		**50**	**96**	**113**	**2528**	**820**	**1530**	**2350**

Non University/ NU- I: In this examination, the student needs to appear and pass the exam. He/ She may present any one full text paper of the interest after critically analyzing before the staff.

Non University/ NU- II: In this examination, the student needs to appear and pass the exam. He/ She may present any one full text paper of the interest after critically analyzing before the staff or a case presentation based on his experience of clinical postings.

The student will complete his 1000 hours of Clinical training during the 2 years program and that will be evaluated through practical examination progressively in all the semester in Evaluative Clinical Practice I, II, III, and IV. The examination will be conducted separately as per the respective specialization.

* Common Papers for all Streams

during the 1st semester, the student will be provided with a mentor. At the conclusion of 2nd Semester, the student will be provided with a Guide for the Project and Dissertation work.

Note: Value Added Course (s), Elective Subjects will remain common for all PG programs of the university. The student may earn 2 credits for each value added or elective subject.

The list of such courses is as under:

1. Yogic Sciences
2. Environment Science
3. Computer Skills Programming
4. English
5. Clinical Nutrition
6. Pedagogy
7. Entrepreneurship
8. Machine Learning

1st Semester

Advanced Human and Health Sciences (Including Genomics)

MPTC 101 T*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 101 T *	Advanced Human and Health Sciences (Including Genomics)	4		4	64	20	80	100

Course Description: This course covers the topics related to advances in Human and Health Sciences with particular emphasis on anatomical, physiological pathological and biochemical advances.

Course Objective: This course aims to study the recent advances in Human and Health Sciences

Course Outcome: On completion of the study of this Course the student should be able; To advance and comprehend the knowledge of the structure & function of the human body in relevance to Physiotherapy To correlate and apply the knowledge gained, in understanding and analysing the dysfunction of the human body

I Applied Anatomy

- Topographic anatomy concerning the neck, arm, leg and back with a focus on vessels, nerves and muscles/fascia and joints.
- Topographic anatomy concerning thorax, abdomen and the pelvic region with a focus on the abdominal wall, viscera, vessels and nerves.
- Surface anatomy and palpations concerning extremities, thorax, abdomen and the pelvic region Pathoanatomy of peripheral nerve injuries, various bone pathologies

II Applied General Physiology

Cardiovascular system

- Physical characteristics of systemic circulation, Pressure pulses
- Oxygen demand theory of local blood flow circulation
- Nervous control of blood circulation, Humorous control of blood circulation,
- Cardiac output and its regulation

Neuromuscular System

- Basic physics of membrane potentials, Recording of membrane potentials and action potentials
- Mechanism of muscle contraction, Sources of energy for muscle contraction, Neural control of movement

Respiratory System

- Review of mechanics of respiration
- Pulmonary volumes and capacities
- Methods of studying respiratory abnormalities
- Regulation of Respiration

III Pharmacology

Drugs used in pain, Local anaesthetics, Steroids, Muscle relaxants, Drugs acting upon central nervous system & autonomic nervous system, Tropically acting drugs. Inhalers, drugs acting on bronchospasm.

IV Pathology

General pathology (cell injury, inflammation, repair, immune system), Musculoskeletal system
Bones: Hereditary & Metabolic diseases (osteoporosis, rickets osteomalacia, osteitis fibrosa cystic, renal osteodystrophy)
Infections: (osteomyelitis, tuberculosis), Joints: Degenerative joint disease, Bursitis
Skeletal Muscles: Muscle atrophy, myositis, muscular dystrophy, myasthenia gravis
Nervous system: Infections (meningitis, encephalitis), vascular diseases (ischaemic encephalopathy, cerebral infarction, intracranial haemorrhage), Degenerative disease (Alzheimer's disease, Huntington's disease, Parkinsonism, motor neuron disease), Demyelinating disease (multiple sclerosis), the peripheral nervous system (peripheral neuropathy, Acute idiopathic polyneuropathy, diabetic neuropathy)
Cardio-respiratory diseases- COPD, Bronchial asthma, Bronchiectasis.

VI General Microbiology

- Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic.
- Sterilization, asepsis, disinfection and universal precautions in relation to patient care and disease Prevention,
- Basic principles of immunity, immunobiology.

VI Biochemistry

- Review of Metabolism: Carbohydrates, Lipids, Proteins and fats, Water: Fluid and electrolyte balance, Water and sodium balance
- Enzymes and Markers in Blood: Cardiovascular Markers: Troponin, Creatinine Kinase, Lactate Dehydrogenase, Myoglobin, Aspartate transaminase.
- Neuromuscular Markers: Acetylcholine, Dopamine, GABA.
- Inflammatory Markers and Free Radicals: TNF alpha, Interleukins, NO, H_2O_2,Superoxides
- Biochemical and Genetic Basis Of Diseases: Cardiovascular Disorders: Myocardial Infarction, Cardiomyopathy, Diabetes, Artherosclerosis, Neuromuscular Disorders: Epilepsy , Parkinson Disease, Alzheimer, Schizophrenia. Muscular Disorders: Cystic Fibrosis, Congenital muscular dystrophy, Duchenne muscular dystrophy, Biochemical, physiological& anatomical change in Ability, Disabilities, Ageing.

Essential Readings

- Clinical Biochemistry (Fundamentals of Biomedical Science) by Nessar Ahmed
- Clinical Biochemistry 6th Edition by Michael Murphy Rajeev Srivastava Kevin Deans ISBN: 9780702072987 eBook ISBN: 9780702072970
- A textbook of Biochemistry by B D Chaurasia
- Textbook of Medical Physiology Guyton and Hall
- Textbook of Physiology by A K Jain

Applied Biomechanics and Kinesiology
MPTC 102 T*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr					Th
MPTC 102 T *	Applied Biomechanics and Kinesiology	3		3	48	20	80	100

Course Description: the course covers the understanding of Biomechanics and kinesiology of body movement.

Course Objective: the course should enable the student to acquire in depth knowledge in understanding the biomechanics and kinesiology.

Course Outcome: On completion of the study of this Course the student should be able to identify and apply the principles of biomechanics and kinesiology in understanding the normal functioning of the human body. To identify and apply the principles of biomechanics in understanding pathomechanics of various conditions. To use these principles in managing various clinical conditions.

I. Tissue Biomechanics and Adaptation: Physical Properties of bone, cartilage, tendon and ligaments, functional adaptation under pathological conditions, Tissue loads, response of tissues to forces- Stress, Strain, Stiffness and mechanical strength, visco elasticity.
II. Mechanism of injury: Overview of Injury Mechanisms, Principles of Mechanical Loading, Principles of Injury, Tissue Injury, Joint Injury
III. Biomechanics, Pathomechanics and muscular involvement in movement of joints of Upper Limb including Shoulder Joint, Elbow Joint, Wrist and Hand Joints
IV. Biomechanics, Pathomechanics and muscular involvement in movement of joints of lower limb, hip joint, knee joint and ankle joint
V. Biomechanics, Pathomechanics and muscular involvement in movement of vertebral Spine including Cervical Spine, Thoracic spine, and Lumbar Spine.
VI. Posture, Effect of gravity and indicate the location of the gravity line in the sagittal plane in optimal posture. Analyze posture with respect to the optimal alignment of joints in the antero posterior and lateral view.
VII. Gait, Stance. Swing and double support phases of gait. Subdivision of the stance and swing phase of gait. Time and distance parameters of gait. Gait Analysis Method.
VIII. Motion analysis - concept, instrumentation and Method

Essential Readings:

1. Kinesiology by Carol A.Oatis
2. Kinesiology – Scientific Basis of Human Motion, Brown &Benchmark
3. Kinesiology and Applied Anatomy by Philip J.Rasch.
4. Clinical Biomechanics of Spine by Punjabi and white
5. Biomechanics – A Qualitative approach for studying Human Motion

6. Joint Structure and Function - A Comprehensive Analysis byNorkin
7. Neumann, Donald A. - Kinesiology of the musculoskeletal system _ foundations for physical rehabilitation.-Mosby Elsevier (2010).

Suggested Readings:

1. Basic Biomechanics in Sports and Orthopedic Therapy
2. The Biomechanics of Sports Techniques by Hay, James G.
3. Basic Biomechanics of Muscular Skeletal System byNordin
4. Introduction to Sports biomechanics
5. Ted Temertzoglou Kinesiology: Lab Manual & Study Guide(2015).

Advanced Diagnostics and Physiotherapeutics

MPTC 103 T*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
MPTC 103 T*	Advanced Diagnostics and Physiotherapeutics	4		4	64	20	80	100

Course Description: The course covers topics related to Advanced and recent updates in physiotherapy treatment with respect to exercise intervention, electrotherapeutics modalities advanced diagnostics.

Course Objective: The course should enable the student to acquire recent knowledge of exercise therapy intervention, electrotherapeutic modalities and advanced diagnostics used in physiotherapy conditions.

Course Outcome: The student should be able to apply recent knowledge and skill related to exercise therapy intervention and electrotherapeutic modalities and advanced diagnostics in different physiotherapy condition for patient recovery**.**

I Exercise and Manual Therapy Intervention &Practice

1. Revision of Assessment techniques like MMT and core evaluation, Goniometry, Types of Exercises: Stretching, Mobilization .Core exercises, Soft tissue manipulation, Re- education, Strengthening, Balance, Coordination exercise, Relaxation Techniques,
2. Exercise therapy intervention & practice in: Pain management ,Endurance impairment, Impaired mobility, Impaired neuromuscular control, Impaired Gait & posture
3. Specific exercise interventions: Isokinetic, Plyometric, Open & closed kinetic chain, PNF, Core stabilization , Aquatic therapy, Home programme & its adherence
4. Specific consideration in exercise therapy: Female, Paediatric, Amputation
5. Specific Techniques: History of Manipulation, Cyriax, Maitland, Mulligan, Neural mobilisation, Mc-Kenzie, Pilates, MET, PRT, MFR and its techniques. Ischemic compression, foam roller and other fascial release therapies, Dry needling, Kochi techniques, visceral mobilization.

II. Electrotherapy Intervention & Practice

1. Pain management
2. Wound management
3. Oedema management
4. Specific deep heat interventions: Class IV Laser, Microwave, Shortwave, Russian current Didynamic current Iontophoresis, Phonophoresis, Biofeedback, Electromagnetic Therapy
5. Special consideration for deep heat modalities: Pregnant women, Menstruating women, Paediatric, Geriatric, Neurologically impaired, Mentally impaired
6. Cryotherapy :Physiological & therapeutic effects, Various techniques
7. Recent advances in cryotherapy application

III. Taping techniques for joints, muscles and various pathological conditions : therapeutic and prophylactic,

IV. Diagnostics in Physiotherapy

1. SD and FG Curve
2. Nerve conduction studies and EMG: Normal & abnormal action potential its recording protocols, analysis and apparatus
3. Biofeedback: principles, effects, uses and contraindications
4. Isokinetic Dynamometry
5. BMI Measurement manually and by equipment

V Radiology and Diagnostic studies: - reading and analysis of:

1. X- Ray, C.T. Scan and MRI Scan, Their clinical relation with various muscular skeletal disorder.
2. Lab pathology investigations: methodology of routine examination of blood, urine only, Analysis of various laboratory examination reports and their clinical correlation with various muscular skeletal disorder and nervous disorders.

Essential reading:

1. Electrotherapy Explained Principles and practice Fourth Edition, Val Robertson,Alex ward, John Low and AnnReed
2. Physical Rehabilitation, SussanBO'Sullivan
3. Tidy's Physiotherapy, Edited by StuartPorter
4. Core Assessment and Training, Human Kinetics with JasonBrumitt
5. Taping Techniques, Rose Mac donald
6. Physical therapy for Children. Suzann K. Cappbell, Robert J.Palisano
7. Physical Agents in Rehabilitation, From Research to Practice, Michelle H.Cameron**Suggested**

Reading:

1. Taping Technique principle and practice, Tom Hewetson and KarinAustin
2. Isokinetics in Human Performance, Lee F.Brown
3. Electrotherapy evidence - based practice: Edited by TimWatson
4. Dutton's Orthopaedic Examination, Evaluation, and Intervention, MarkDutton

Research Methodology and Biostatistics
MPTC 104 T*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
MPTC 104 T*	Research Methodology and Biostatistics	3		3	48	20	80	100

Course Description: The course covers the concept of research methodology, EBP and biostatistics related to physical therapy.

Course Objective: The course aims to introduce the principles of research, methods of research and analysing the research studies using Biostatistics.

Course Outcome: On completion of the study of this Course the student should be able to understand the methods of research process and design so as to effectively plan a research. To understand the statistical measures used in the analysis and interpretation of research data. To acquire skills of critically reviewing the literature.

Research Methodology

I Introduction to Research in Physiotherapy
Introduction, Research for Physiotherapist: – Definition, concept, purpose, types, and phases approaches

II Fundamentals of Research
Define measurement**,** Measurement framework**,** Scales of measurement**,** Types of variables**,** Reliability &Validity

III Research Proposal writing (for grants), Critical Analysis of an Article
Defining a problem, Review of literature, Formulating a question, operational definition, Method of sampling and assignment, Inclusion and Exclusion criteria, Data collection &analysis, Results, Interpretation, Conclusion, Discussion, Informed consent, Limitations. Grant Agencies

IV Research Design
Principle of designing, Design, instrumentation & analysis for: qualitative research, quantitative research Group design and Single system design, experimental and non-experimental research, Designs models for Physiotherapy

V Research Ethics
Importance of Ethics in research, Ethical issues in human Courses' research, Ethical principles that govern research with human courses, Components of an ethically valid informed consent for research

VI Research and Evidence-Based Practice
Concept of evidence-based practice by addressing topics related to: search strategy, database, Critical analysis of evidence.

Biostatistics

I Introduction to Biostatistics

Introduction- Definition and Application in physiotherapy, Data Presentation-Drawing tables, graphs, master chart etc, Standard error, Types I & II error, Hypothesis Testing, Null Hypothesis, Alternative hypothesis, Acceptance & rejection of null hypothesis, Level of significance

II Measures of Central Value & Measures of Dispersion

Arithmetic mean, median mode, Relationship between them Measures of Dispersion absolute and relative, Normal Distribution Curve- Properties of normal distribution, Standard normal distribution, skewness and kurtosis

III Correlations & Regression Analysis

Bivariate distribution, Scatter diagram, Coefficient of correlation, Calculation & interpretation of correlational coefficient, Lines of regression
Calculation of Regression Coefficient

IV Analysis and Evaluation

Parametric & Non Parametric Tests- Chi-square test, Mann-Whitney U test, Wilcoxon Signed test, Kruskal-Wallis test, Friedman test, T-test/student T-test, Analysis of variance, Software Used in Research and Statistical Analysis

Essential Readings:

1. Research for physiotherapists Research for Physiotherapists: Project Design and Analysis by Carolyn M. Hicks
2. APA Handbook of Research Methods in Psychology by Harris Cooper, PhD
3. Elements of Research in Physical Therapy by Dean P. Currier
4. Mahajan's Methods In Biostatistics For Medical Students And Research Workers by Bratati Banerjee

Suggested Readings:

1. Physical Therapy Research by Elizabeth
2. An Introduction to Biostatistics 3rd Edition, by Thomas Glover , Kevin Mitchell
3. Introduction to research in Health Sciences by Stephen Polgar, BSc (Hons), MSc, Shane A. Thomas
4. Research Methodology: Methods and Techniques by C R Kothari
5. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches by John W. Creswell

Advanced Human and Health Sciences (Including Genomics)
MPTC 101 P*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPT C 101 P *	Advanced Human and Health Sciences (Including Genomics)		2	1	32	10	40	50

Course Description: This course covers the topics related to advances in Human and Health Sciences with particular emphasis on anatomical, physiological pathological and biochemical advances.

Course Objective: This course aims to study the recent advances in Human and Health Sciences

Course Outcome: On completion of the study of this Course the student should be able; To advance and comprehend the knowledge of the structure & function of the human body in relevance to Physiotherapy To correlate and apply the knowledge gained, in understanding and analysing the dysfunction of the human body

Demonstration of the following lab tests:

1. Enzymes and Markers in Blood: Cardiovascular Markers: Troponin, Creatine Kinase, Lactate Dehydrogenase, Myoglobin, Aspartate transaminase.
2. Neuromuscular Markers: Acetylcholine, Dopamine, GABA.
3. Inflammatory Markers and Free Radicals: TNF alpha, Interleukins, NO, H2O2,Superoxides
4. Surface marking of anatomic landmarks

Applied Biomechanics and Kinesiology
MPT C 102 P*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
MPT C102 P *	Applied Biomechanics and Kinesiology		3	2	48	10	40	50

Course Description: The course covers topics related to practical training on biomechanics and kinesiology.

Course Objective: The course should enable the student to attain in-depth knowledge and skill in techniques used in biomechanics and kinesiology.

Course Outcome: The student should be able to demonstrate skill in techniques used in in biomechanics and kinesiology.

1. Detection of scapular position in rotation of spinous process
2. Measurement of functional limb varus under bilateral and unilateral stance
3. Subtalar neutral joint positioning
4. Determination of Q-angle
5. Measurement of eversion and inversion ranges at subtalar joint
6. Measurement of popliteal angle
7. Measurement of calcaneal inversion and eversion in non-weight bearing and Weight bearing stance

Advanced Diagnostics and Physiotherapeutics
MPTC 103 P*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
MPTS 103 P*	Advanced Diagnostics and Physiotherapeutics		3	2	48	10	40	50

Course Description: The course covers topics related to Practical aspects in Advanced and recent updates in physiotherapy treatment with respect to exercise intervention and electrotherapeutics modalities.

Course Objective: The course should enable the student to acquire recent knowledge of exercise therapy intervention and electrotherapeutics modalities used in physiotherapy conditions.

Course Outcome: The student should be able to apply recent knowledge and skills related to exercise therapy intervention and electrotherapeutic modalities in different physiotherapy condition for patient recovery**.**

1. High class electrotherapeutic modalities like LASER Class IV, Extra Corporeal Shock Wave, Isokinetic exercises, Vacuum Therapy, Electromagnetic Therapy, etc.
2. Interpretation of X- Ray, CT Scans and MRI of various musculoskeletal conditions.
3. Isokinetic Testing
4. Interpretation of EMG
5. Body Composition using different anthropometric measurement
6. All the techniques, like Mulligan, Mckanzie, Maitland, Cyiax, Joint Techniques, Karltenborn, Soft tissue techniques, Butler, Positional release, MET
7. Taping Techniques- Kinesio and Dynamic

Evaluative Clinical Practice- I

MPTC 106 P*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
MPTS 107 P*	Evaluative Clinical Practice- I (Based on Viva, Case presentation of clinical postings)		15	8	240	50	50	100

Course Description: The course covers topics related to hands on training in physiotherapy assessment and management of different disease and disorders that the student would see during clinical postings.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in physiotherapy assessment and management of disease and disorders.

Course Outcome: The student should be able to interpret and differentiate between various, diagnostic tools used for therapeutic plan, by history taking process initially, of the conditions of patients. They should have knowledge of all the physiotherapeutic intervention pertaining to the patient. They should be able to evaluate and plan physiotherapy treatment: its presentation and documentation of all the conditions.

- The student will present a case (study/ description) from his/ her clinical postings, including, Demographic Data, history taking, subjective and objective examination, differential diagnosis, confirmatory diagnosis and possible physiotherapeutic plan.

2nd Semester

Exercise Physiology

MPTC 201 T*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
MPTC 201 T*	Exercise Physiology	4		4	64	20	80	100

Course description: This course aims to deliver scientifically based standards on exercise testing and prescription. It prepares students through the process of selecting and administering fitness assessments, using Guidelines to interpret results, and drafting an exercise prescription that is in line with Guidelines parameters.

Course Objective: this course should deliver the concepts in exercise physiology and prepares students to test and prescribe suitable exercises to different group of population.

Course Outcome: On completion of the study of this Course the student should be able to select and administer fitness assessments, using Guidelines to interpret results, and drafting an exercise prescription to different populations.

I. Bioenergetics and Exercise metabolism

Energy transfer in cells during exercise, Oxygen metabolism and transfer during metabolism, Oxygen transport in blood, Oxygen deficit and debt, Oxygen measurement, oxygen during exercise, oxygen during recovery, Energy release from carbohydrates, lipids, and proteins, Principles of training, Aerobic training, Anaerobic training, System adaptation to aerobic and anaerobic training, Measurement of energy expenditures (direct and indirect calorimetry)

II. Cardiovascular System and Exercise

Cardiovascular regulation and integration during exercise, Cardiovascular adaptations to sustained aerobic exercises, Cardiovascular Endurance testing, Athletes heart and sudden cardiac death in sports, Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile, Energy cost and breaking Cardiovascular drift, blood pressure during exercise

III. Respiratory System and Exercise

Lung function and its role in exercise performance Regulation of respiration during exercise, Acid-Base regulation during exercise, Respiratory adaptations to sustained aerobic exercise, Air Conditioning, Second wind, Oxygen debt, Regulation of ventilation

IV. Musculoskeletal System and Exercise

Growth and exercise, Repair and adaptation during exercise, Biochemical responses and molecular mechanisms to endurance and power training, Effects of training and detraining, Strength Measurement, Dynamometery, DOMS, Strength training, **Fatigue -** Muscle fiber, types and its role in exercise performance Muscle endurance testing, Assessment of muscle damage &fatigue, Exercise associated muscle cramps.

V Gastrointestinal Tract and Endocrine System and Exercise

Effect of exercise on GIT and liver, Hormone regulation of fluid and electrolytes during exercise, Stress hormones in exercise, Opioids and Runners High

VI. Nervous system and Exercise

General nervous system function, sensory information and reflexes, Somatic function, and motor neuron, Exercises enhances brain health, Overview of heat balance during exercise, Body's Thermostat – Preoptic-anterior Hypothalamus, Exercise in Hot, Exercise in cold environment, Control of internal environment-homeostasis, Exercise and immune system

VII. Exercise Testing Prescription and Aging

Prescription of exercise, General guidelines for improving general health and fitness, Exercise prescription for fitness. Human performance analysis, Exercise stress testing for the diagnosis of CHD, Body composition, Aging and physiological function, Exercise and longevity, Exercise prescription for healthy, aged, sedentary adults, Osteoporotic and mood disorders.

Essential Readings:

1. Exercise Physiology by Mc Ardle, Katch and katch
2. Text Book of Radiology by K.Bhargava
3. Electromyography and Neuromuscular disorders by David C.Preston
4. Cram's Introduction to Surface Electromyography
5. ACSM's Guidelines for Exercise Testing and Prescription Paperback of Sports Medicine

Suggested Readings:

1. Essentials of Electromyography by Gabriel
2. Johnson's Practical Electromyography Hardcover– 15 Sep 2005 by Williams Pease(Editor), Henry L. Lew (Editor), Ernest W.Johnson

Pulmonary Medical and surgical conditions
MPTC 202 T

Subject Code	Subject	Hrs/ Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 202 T	Pulmonary Medical and surgical conditions	4		4	64	20	80	100

COURSE OBJECTIVES AND OUTCOMES:

Student will acquire knowledge to enhance professional skills to do the Fundamental Assessment of Pulmonary Conditions independently to address issues during independent practice or as a part of an organisations.

An overview of diagnostic imaging techniques is presented, with special emphasis on the role of the physiotherapist in using imaging within the scope of physiotherapy and to plan physiotherapy care.

Students will be able to use this knowledge on medical and surgical conditions and enhance his skills in planning and tailoring effective, specific, safe Physiotherapy treatment programmes and work collaboratively in group settings.

Student will understand the effects and potential side effects of medical and pharmaceutical intervention and Pharmacological considerations.

Course outcome: This course will provide the student with in depth knowledge on the epidemiology, pathogenesis, clinical presentation, relevant diagnostic tests and medical management and help to form the basis of surgical management of disorders of the medical and systemic conditions related to pulmonary system.

Course Description:

MODULE I:

Medical conditions: Review of pulmonary disease and their systemic manifestations. Epidemiology, pathomechanics, clinical presentation, relevant diagnostic tests (ECG, Echocardiography, Cardiac Catheterisation, Radionuclide Scanning, Stress Testing, ABG,Labs, etc.), and management: Following are the topics to be included but not limited to: Asthma, COPD, Restrictive Lung Disorder, Suppurative lung disease, Occupational lung disease

Chest wall deformities, Lung cancer, Sleep apnoea , Pleural diseases , Infections of The Respiratory System, Interstitial And Infiltrative Pulmonary Disorders, Pulmonary Disorders Due ToSystemic Inflammatory Disease, Pulmonary Vascular Diseases, Respiratory Failure, Burns and Inhalation burns.

Neuromuscular And Skeletal Disorders Leading To Global Alveolar Hypoventilation (Myopathies, Spinal Muscular Atrophies , Poliomyelitis , Motor Neuron Disease , SCI, HSMN, Kyphoscoliosis, Pectus Carinatum, Pectus Excavatum), Pathophysiology of Paralytic-Restrictive Pulmonary Syndromes, Conventional Approaches to Managing N-M Ventilatory Failure

Surgical Management of the above Conditions, Indications, Contra-Indications for Surgery, Preoperative Assessment of Patients, procedure and Precautions after Surgery. Also Included but not limited to:

Thoracoscopy, Lobectomy, Pneumonectomy, Thoracotomy, Pluerodesis, Pleurectomy, Blebectomy, Lung resection, Inter costal drainage (ICD), VATS (Video assisted thoracic surgery) and, RecentAdvancements and Medical Robotic Surgeries

Complications of pulmonary surgery and pulmonary failure, Lung Transplantation

MODULE II

Medical and pharmaceutical intervention and Pharmacological considerations. following are the topics to be included but not limited to:

Drugs used in pain, Local anaesthetics, Steroids, Muscle relaxants, Drugs acting upon centralnervous system & autonomic nervous system

Drugs Affecting Respiratory System – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers, oxygen delivery devices

Suggested Reading:

1. Hurtz: The Heart
2. Principles And Practice Of Medicine. Davidson
3. Harrison's Principles Of Internal Medicine. Braunwald, Fauci, Kasper
4. General Surgery. Bailey And Love
5. Guidelines for Pulmonary Rehabilitation Programs-by AACVPR
6. Principles and Practice of Cardiopulmonary Physiotherapy. D Frownfelter, E Dean
7. ACSM'S Guidelines for Exercise Testing and Prescription

8. Fundamental Principles Of Exercise Physiology - For Fitness, Performance, And Health – Robert A.Robergs And Scott O. Roberts.
9. Advances in Cardiopulmonary Rehabilitation - by Jobin, Jean,
10. Advancing the Frontiers of Cardiopulmonary Rehabilitation - by Jobin, Jean.
11. Exercise Prescription- by Swain, David P,
12. Clinical Exercise Physiology - by Ehrman, Jonathan.
13. Guidelines for Cardiac Rehabilitation & Secondary Prevention Program,– AACVPR,
14. AACVPR Cardiac Rehabilitation Resource Manual, AACVPR
15. Heart Disease and Rehabilitation - by Pollock & Schmidt
16. Cardiovascular Prevention and Rehabilitation - by Joep Perk, Helmut Gohlke, Irene Hellemans, PhilippeSellier, Peter Mathews, Catherine Monpère, Hannah McGee and Hugo Saner
17. Lifestyle Management for Patients With Coronary Heart Disease - by Houston Miller,
18. Textbook of general medical and surgical conditions for physiotherapists – Downie Bros.
19. Essential of Cardiopulmonary physical therapy – Hillegass and Sadowsky.
20. Text book of Chest, Heart and Vascular Disorders for Physiotherapists – Downie Bros.
21. Cardiopulmonary physical therapy – Irwin and Tecklin – Mosby
22. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics, 4e (Physiotherapy Essentials)by Jennifer A. Pryor, Ammani S Prasad.

Advanced Physiotherapeutics- in Pulmonary medical and surgical conditions

MPTC 203 T

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 203 T	Advanced Physiotherapeutics- in Pulmonary Medical and surgical conditions	6		6	96	20	80	100

COURSE OBJECTIVES AND OUTCOMES:

Given a real life situation, student will be able to establish and document an appropriate physical therapy examination, evaluation, diagnosis, prognosis and intervention including procedures for obtaining appropriate referral to, and assistance from other members of the healthcare community.

Student will be able to understand and integrate the implications of anatomy, physiology, exercise physiology, and risk factors on the client problems and apply the therapeuticPrinciples and Practice in pulmonary Rehabilitation

On completion of this course the student will be able to follow a Stepwise screening model for differential diagnosis that includes past medical and surgical history, risk factor assessment, clinical presentation, associated signs and symptoms, and review of symptoms

Student will also learn professional skills to do the Fundamental Assessment ofPulmonary Conditions independently to address issues during independent practice or as a part of anorganisations.

Students will be able to use this information and enhance his skills in planningand tailoring effective, specific, safe Physiotherapy treatment programmes and work collaborativelyin group settings.

Course Outcome: This course also provides the basis of assessment and management of disordersof the medical and surgical conditions related to pulmonary system and enhance the skills in planning and tailoring effective, specific, safe Physiotherapy treatment programmes and work collaboratively in group settings.

MODULE I

Fundamental Clinical evaluation and assessment of respiratory dysfunction. Following are the considerations in assessments, to be done for pulmonary medical and surgical conditions like: Asthma, COPD, Restrictive Lung Disorder, Suppurative lung disease, Occupational lung disease, Chest wall deformities, Lung cancer, Sleep apnoea, Pleural diseases, Infections of The Respiratory System, Interstitial And Infiltrative Pulmonary Disorders, Pulmonary Disorders Due ToSystemic Inflammatory Disease, Pulmonary Vascular Diseases, Respiratory Failure, Burns and Inhalation burns.

Skills of physiotherapeutic function, measurement and documentation, SOAP format, History taking, Cardinal signs, Inspection, Palpation, Percussion, Auscultation relevant to cardiopulmonary sciences Basic principles and concepts of Multisystem assessment and laboratory investigations and Outcome measures including but not limited to:

Pulmonary Function tests, Arterial blood gas analysis, Imaging of the heart, Electrocardiogram identification, Multisystem assessment and laboratory investigations, and Outcome measures: Functional performance assessment- 2MWT, 3MWT, 6MWT, 12MWT, modified shuttle test, steptest, other Quality of life measures.

Respiratory muscle fatigue, and Respiratory muscle training- Assessment, training methods inhealth and disease and with implications in elderly and children.

Scales used in pulmonary rehabilitation: Becks Depression Inventory (BDI) and Hamilton Anxiety Scale (HAS); mini-mental state examination, SGRQ, CRQ, SF-36, CAT, Activities specific balance scale (ABC), etc.

Functional evaluation: Functional assessment and outcome scales and questionnaires. Evaluation Methods, Special tests and Scales used in Musculoskeletal, Neurological and Cardiopulmonary disorders

MODULE II

Clinical Application of Physiotherapy Techniques in medical and surgical conditions:General Concepts and Advanced Treatment Strategies for Pulmonary Conditions like

Neuromuscular And Skeletal Disorders Leading To Global Alveolar Hypoventilation (Myopathies, Spinal Muscular Atrophies, Poliomyelitis, Motor Neuron Disease, SCI, HSMN, Kyphoscoliosis, Pectus Carinatum, Pectus Excavatum), Pathophysiology of Paralytic-Restrictive Pulmonary Syndromes, Conventional Approaches to Managing N-M Ventilatory Failure

Thoracoscopy, Lobectomy, Pneumonectomy, Thoracotomy, Pleurodesis, Pleurectomy, Blebectomy, Lung resection, Inter Costal drainage (ICD), VATS (Video-assisted thoracic surgery) and, Recent Advancements and Medical Robotic Surgeries

Complications of pulmonary surgery and pulmonary failure, Lung Transplantation

Airway Clearance: Percussion, Vibration, Shaking, Quick Stretch, Postural drainage, Huffing &

Coughing, Suctioning procedure, Manual hyperinflation, Facilitating airway clearance with coughing techniques: Cough pump, Complications, Cough evaluation, Assisted coughing techniques, Active cycle of breathing, Autogenic Drainage, Glossopharyngeal, Breathing, Pursed lip breathing, relaxed breathing, segmental breathing, indications and CI for each technique, Positive expiratory pressure, High -frequency chest wall oscillation, Intrapulmonary Percussive ventilation, Acoustic airway clearance.

Body positioning: Prescriptive versus routine body positioning, Physiological effects of various body positions, Physiological effects of frequent changes in body position, Prescription of therapeutic body positions and body position changes, Mechanical body positioning,

Ventilatory facilitatory techniques, Vibratory PEP Devices: Acapella, Flutter, Non-Vibratory PEPDevices: Thera PEP, Respiratory muscle training, Physiotherapy to increase lung volume, Lung expansion therapy, Incentive spirometry, CPAP, IPPV.

Physiotherapy to decrease the work of breathing: Handling breathlessness, Relaxed positions, relaxation, Breathing re-education, Oxygen therapy and humidification, oxygen toxicity, Nebulization, Aerosol therapy, Diaphragm Stimulation Techniques, Stretching techniques, and strengthening techniques.

Recent advances in the techniques used for treatment and rehabilitation.

Physiotherapy after Surgical Management of the Conditions, Indications, Contra-Indications, Preoperative Assessment of Patients in case of Elective surgery, procedure, and Precautions before and after Surgery. Also Included but not limited to:

Thoracoscopy, Lobectomy, Pneumonectomy, Thoracotomy, Pleurodesis, Pleurectomy, Blebectomy, Lung resection, Inter costal drainage (ICD), VATS (Video-assisted thoracic surgery) and Recent Advancements and Medical Robotic Surgeries

Complications of pulmonary surgery and pulmonary failure, Lung Transplantation

Module III Physiotherapy in ICU

Anaesthesiology

Anaesthesia: types, benefits, effects on pulmonary system, complications, Post-operative atelectasis: types, pathogenesis, and management, Ventilation-perfusion mismatch, shunting of blood in lungs, dead space ventilation.

Respiratory Mechanics after anesthesia. Medical gas therapy: Oxygen therapy: Oxygen TherapyMethods, Oxygen Delivery Devices, Oxygen toxicity, Hyperbaric Oxygen therapy, Other Medical gas therapies. Artificial airways and Maintaining and Removing Artificial Airway: Suctioning, establishing an artificial airway, airway maintenance, extubation or decannulation, Bronchoscopy: Principle, method, use, and complication. Management of endotracheal tubes, tracheal suctioning, subclavianlines & chest tubes.

Intensive Care Unit and Emergency care

Invasive and non-invasive mechanical ventilation: Modes, Physiological Effects, Indications, Contraindications, Benefits, Complications, Weaning from Ventilator, Mechanical Ventilation in

Respiratory disorders and under influence of Anaesthesia., Extubation & post-extubation care.

Investigative Techniques & Radio diagnostics and Principles of pathological investigations and imaging techniques related to pulmonary disorders with interpretation & analysis of: Blood test and blood biomarkers and its clinical significance.

Functioning of ECMO vs Mechanical Ventilator Management of endotracheal tubes, tracheal suctioning. Poisoning and drug overdose, Symptoms of hypoxia & carbon-dioxide narcosis.

Suggested Reading:

1. General Surgery. Bailey And Love
2. Hurtz: The Heart
3. Principles And Practice Of Medicine. Davidson
4. Harrison's Principles Of Internal Medicine. Braunwald, Fauci, Kasper
5. Guidelines for Pulmonary Rehabilitation Programs-by AACVPR
6. Principles and Practice of Cardiopulmonary Physiotherapy. D Frownfelter, E Dean
7. ACSM'S Guidelines for Exercise Testing and Prescription
8. Fundamental Principles Of Exercise Physiology - For Fitness, Performance, AndHealth – Robert A. Roberts And Scott O. Roberts.
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10. Advancing the Frontiers of Cardiopulmonary Rehabilitation - by Jobin, Jean.
11. Exercise Prescription- by Swain, David P,
12. Clinical Exercise Physiology - by Ehrman, Jonathan.
13. Guidelines for Cardiac Rehabilitation & Secondary Prevention Program,– AACVPR,
14. AACVPR Cardiac Rehabilitation Resource Manual, AACVPR
15. Heart Disease and Rehabilitation - by Pollock & Schmidt
16. Cardiovascular Prevention and Rehabilitation - by Joep Perk, Helmut Gohlke, Irene Hellemans, Philippe Sellier, Peter Mathes, Catherine Monpère, Hannah McGee and HugoSaner
17. Lifestyle Management for Patients With Coronary Heart Disease - by Houston Miller,
18. Textbook of general medical and surgical conditions for physiotherapists – Downie Bros.
19. Essential of Cardiopulmonary physical therapy – Hillegass and Sadowsky.
20. Text book of Chest, Heart and Vascular Disorders for Physiotherapists – Downie Bros.
21. Cardiopulmonary physical therapy – Irwin and Tecklin – Mosby

Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics, 4e (Physiotherapy Essentials) by Jennifer A. Pryor, Ammani S Prasad

YOGIC SCIENCES
MPTC 204 T*

Course Outcomes:
The students will be able to appreciate the role of yoga in their day to day life. The course has focus on basic concept of yoga, ashtanga yoga and its effect, various kinds of asanas and pranayama and different aspects of mudra.

Module I : Introduction of Yoga

- Etymology of Yoga
- Concept of Chitta and Chitta Bhumis
- General introduction to four paths of Yoga
- Importance of Nadi & Chakra in Yoga

Module II : Ashtanga Yoga: Purpose, Significance and Effects
Eight limbs of Yoga as per Yogasutra of Patanjali – Discipline/self-restraint (Yama), Observance (Niyama), Posture (Asana), Restraint of breath/exercises of life force (Pranayama), Abstraction of senses/Introversion-of attention (Pratyahara), Concentration (Dharna), Meditation(Dhyana) and Super conscious state/illumination (Samadhi)

Module III : Asana and Pranayama

- Introduction of Asanas
- Benefits and Contra-indication of Asanas
- Define and understand the concept of Prana & Pranayama
- Benefits and Contra-indication of Pranayama
- Physiological effect of Pranayama

Module IV : Shatkarma, Mudra and Bandh

- Introduction of Mudra
- Benefits and Contra-indication of Mudra
- Introduction of Bandh
- Benefits and Contra-indication of Bandh
- Introduction of Shatkarma
- Benefits and Contra-indications of Shatkarma

Module V :

- Yoga Nidra (The Conscious Dynamic Sleep),
- Meditation Technique
- Cause of Pain (Dukha) according to Yog Sutra of Patanjali
- Yogic lifestyle (Ahara, Vihar, Achar, Vichar),
- Yogic attitudes (Maitri, Karuna, Mudita and Upeksha) and practices for Mental Wellbeing.

Reference Books
1. Asana Pranayama Mudra Bandha by Swami Satyananda Saraswati. Publisher: Yoga Publication Trust, Munger, Bihar, India

2. Karma Yoga, Bhakti Yoga, Raja Yoga, JnanaYoga by Swami Vivekananda
3. Yoga Nidra by Swami Satyananda Saraswati. Publisher: Yoga Publication Trust, Munger, Bihar, India
4. Yoga Sutras of Patanjali by Swami Venkateshananda Publisher: Motilal Banarsidas Publishers Private Limited, New Delhi, India
5. Hatha Yoga by Swami Sivananda. Publisher: The Divine Life Society, Uttarakhand, India
6. Gheranda Samhita by Swami Niranjanananda Saraswati. Publisher: Yoga Publication

Machine Learning

MPTS 205T*

COURSEOVERVIEW: Machine learning is an area of artificial intelligence and computer science that comprises supervised and unsupervised learning and includes the development of software and algorithms that can make predictions based on data. Acquire the knowledge about various Therapeutic/ Physical agents to be used in combination with various electro – therapeutic modes, with appropriate clinical decision & reasoning in the management of pain / tissue healing / Wound care etc. through Tele-Rehabilitation or M Health.

COURSE OBJECTIVES: At the end of the course the candidate will be able to apply the basic concepts and applications of Artificial Intelligence and Machine Learning for tele-rehabilitation and M Health.

MODULE I

Introduction to Machine Learning: Introduction, Types of Machine Learning: Supervised, Unsupervised, Reinforcement learning and Transfer Learning, Applications. Machine Learning and Medical bio-sensors: ML in micro biosensors and devices for electronic data capture (ECG, Actigraphy, Oximetry), data disambiguation techniques.

MODULE II

Introduction to Artificial Intelligence, AI fundamentals, Use applications of AI, Issues concerning AI in Physiotherapy. AI and ML in Healthcare and Physiotherapy, Tele-rehabilitation, Tele- Physiotherapy and M Health.

REFRENCE BOOKS:

1. Russell, Norvig, Arti_cial Intelligence: A Modern Approach, Third edition, Prentice Hall, 2010
2. Daphne Koller and Friedman. Probabilistic Graphical Models - Principles and Techniques, The MIT Press, 2009
3. Machine Learning with R: Expert techniques for predictive modeling, by Brett Lantz, 3 rd Edition
4. Hands-on programming with R: Write your own functions and simulations by Garrett Grolemund, 2014

Exercise Physiology

MPTC 201 P*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
MPTC 201 P*	Exercise Physiology		2	1	32	10	40	50

Course Description: The course covers topics related to practical training on exercise physiology, exercise testing and exercise prescription for different age groups and patient population. The student also undergoes hands on training in physiology and clinical biochemistry.

Course Objective: The course should enable the student to attain in-depth knowledge and skill in techniques used in exercise physiology, exercise testing and exercise prescription for different age groups and patient population. They should be able to attain skills in physiology and clinical biochemistry techniques also.

Course Outcome: The student should be able to demonstrate skill in techniques used in exercise physiology, exercise testing and exercise prescription for different age groups and patient population. They should be able to demonstrate skills in physiology and clinical biochemistry techniques also.

1. Energy expenditure and exercise
2. Energy metabolism
3. Cardiovascular effect of exercise
4. Respiratory air flow and volume
5. Respiratory gas analysis
6. Blood pressure in humans
7. Electromyogram (EMG) recording and interpretation
8. Oxygen concentration (02 measurements)

Pulmonary Medical and surgical conditions
MPTC 202 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 202 P	Pulmonary Medical and surgical conditions		3	2	48	10	4	50

Course Description: The course covers topics related to assessment, diagnosis and management of Pulmonary Medical and surgical conditions.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in understanding of assessment, diagnosis and management of Pulmonary Medical and surgical conditions

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in the subject.

1. Student must be demonstrated different conditions with patients.
2. Evaluation of condition subsequence.

Advanced Physiotherapeutics- in Pulmonary medical and surgical conditions
MPTC 203 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 203 P	Advanced Physiotherapeutics- in Pulmonary Medical and surgical conditions		3	2	48	10	40	50

Course Description: The course covers topics related to assessment, diagnosis and advanced physiotherapy management of Pulmonary Medical and surgical conditions.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in understanding of assessment, diagnosis and physiotherapy management of Pulmonary Medical and surgical conditions

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in the subject.

1. Student must be demonstrated different conditions with patients and applied physiotherapy techniques.
2. Evaluation of condition subsequence.

Evaluative Clinical Practice- II
MPTC 206 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 206 P	Evaluative Clinical Practice- II** (Based on Viva, Case presentation of clinical postings)		15	8	240	50	50	100

Course Description: The course covers topics related to hands on training in physiotherapy assessment and management of different disease and disorders that the student would see during clinical postings.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in physiotherapy assessment and management of disease and disorders.

Course Outcome: The student should be able to interpret and differentiate between various, diagnostic tools used for therapeutic plan, by history taking process initially, of the conditions of patients. They should have knowledge of all the physiotherapeutic intervention pertaining to the patient. They should be able to evaluate and plan physiotherapy treatment: its presentation and documentation of all the conditions.

- The student will present a case (study/ description) from his/ her clinical postings, including, Demographic Data, history taking, subjective and objective examination, differential diagnosis, confirmatory diagnosis and possible physiotherapeutic plan.

Research Appraisal- II
MPTC 207P Non University/ NU- II

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 207P Non University/ NU- II	Research Appraisal- II		2	1	32	50	-	50

Course Description: The course covers topics related to writing and development of project work.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in writing and development of projects. To also enable the student the publish the review paper in a good journal (possibly Scopus) at the end of 2nd semester with the guidance of the mentor provided.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in writing and development of projects. They should be able to prepare a formal research proposal on the chosen topic for the dissertation under the guidance of supervisor. The student shall make a final presentation of the topic in front of the committee.

The student should be able to demonstrate adequate knowledge and skill in writing and development of projects. They should be able to prepare a formal research proposal on the chosen topic for the dissertation under the guidance of the mentor.

1. Identifying the problem and statement of research question
2. Review of literature
3. Existing knowledge and gap in knowledge
4. Quality of publications
5. Type of publications
5. Databases
6. Search strategies
7. Costing
8. Ethical concerns
9. Knowledge addition

3rd Semester

Cardiovascular medical and Surgical conditions

MPTC 301 T

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 301 T	Cardiovascular medical and Surgical conditions	4		4	64	20	80	100

COURSE OBJECTIVES AND OUTCOMES:

Student will acquire knowledge to enhance professional skills to do the Fundamental Assessment of Cardiovascular Conditions independently to address issues during independent practice or as a part of an organisations. An overview of diagnostic imaging techniques is presented, with special emphasis on the role of the physiotherapist in using imaging within the scope of physiotherapy and to plan physiotherapy care. Students will be able to use this knowledge on medical and surgical conditions related to the system under consideration and enhance his skill in planning and tailoring effective, specific, safe Physiotherapy treatment programmes and work collaboratively in group settings. Student will understand the effects and potential side effects of medical and pharmaceutical intervention and Pharmacological considerations.

Course outcome: This course will provide the student with in depth knowledge on the epidemiology, pathogenesis, clinical presentation, relevant diagnostic tests and medical management and form the basis of surgical management of disorders of the medical and systemic conditions related to Cardiovascular system.

Course Description:

MODULE I

Medical conditions: Review of cardiopulmonary disease and Cardiovascular and pulmonary manifestations of systemic conditions: Epidemiology, pathogenesis, clinical presentation, relevant diagnostic tests (ECG, Echocardiography, Cardiac Catheterisation, Radionuclide Scanning, Stress Testing, ABG, Labs, etc.) and management. Following are the topics to be included but not limited to:

Assessment of Symptoms of Heart Disease , Congenital heart diseases, Acquired heart disease, Coronary artery disease, Pulmonary and Systemic Hypertension, Orthostatic Hypotension , Diseases of myocardium, Pericardial disease, Tumors of the heart , Peripheral Vascular Disorders,

Disorders of Cardiac Rate, Rhythm and Conduction and ECG interpretation, Cardiac Arrest, Cardiac Failure, Shock, Rheumatic Fever, Diseases of the Heart Valves, CPCR, Heart Disease In Pregnancy, Degenerative Arterial Disease, Inflammatory Arterial Disease, Diabetes and Amputation

Surgical Management of the Conditions, Indications, Contra-Indications for Surgery, Preoperative Assessment of Patients and Precautions after Surgery. Also Included but not limited to:

Hemodynamic Performance of CTVS Patients, A-V Shunt, Incisions and Procedures on Sternum, Chest Wall, Diaphragm, Mediastinum, Oesophagus

CTVS Procedures: Outline And Definition Of Procedures, Differences in Open and Closed Heart Surgery, Extra-Corporeal Circulation: Techniques, Cardiopulmonary Bypass: Pathophysiology And Introduction To OPCAB, LV Assist Devices. Recent Advances Like MIDCAB, OPCAB, Heart-Port, Heart Transplant, Recent Advancements and Medical Robotic Surgeries

Complications of Cardiac Surgery (Thrombo-Embolism in Brain, Lungs and Distal Vessels, Phrenic Nerve Injuries, Unstable Sternum and Implication of Procedures like Omentoplasty, Etc.)

MODULE II

Medical and pharmaceutical intervention and Pharmacological considerations. Following are the topics to be included but not limited to

Drugs used in pain, Local anesthetics, Steroids, Muscle relaxants, Drugs acting upon central nervous system & autonomic nervous system

Anti-anaemic, Anti-Coagulants, Thrombolytic Agents, CV Drugs (beta-blockers, calcium channel blockers), Cardiac Glycosides , Anti-Anginal, Peripheral Vasodilators, Anti-HTN, Anti- Arrhythmic, Anti-Hyperlipidaemic And Hypocholesterolemic, Diuretics

Suggested Reading:

1. Hurtz: The Heart
2. Principles And Practice Of Medicine. Davidson
3. Harrison's Principles Of Internal Medicine. Braunwald, Fauci, Kasper
4. General Surgery. Bailey And Love
5. Guidelines for Pulmonary Rehabilitation Programs-by AACVPR
6. Principles and Practice of Cardiopulmonary Physiotherapy. D Frownfelter, E Dean
7. ACSM'S Guidelines for Exercise Testing and Prescription
8. Fundamental Principles Of Exercise Physiology - For Fitness, Performance, And Health – Robert A. Roberts And Scott O. Roberts.

9. Advances in Cardiopulmonary Rehabilitation - by Jobin, Jean,
10. Advancing the Frontiers of Cardiopulmonary Rehabilitation - by Jobin, Jean.
11. Exercise Prescription- by Swain, David P,
12. Clinical Exercise Physiology - by Ehrman, Jonathan.
13. Guidelines for Cardiac Rehabilitation & Secondary Prevention Program,– AACVPR,
14. AACVPR Cardiac Rehabilitation Resource Manual, AACVPR
15. Heart Disease and Rehabilitation - by Pollock & Schmidt
16. Cardiovascular Prevention and Rehabilitation - by Joep Perk, Helmut Gohlke, Irene Hellemans, PhilippeSellier, Peter Mathes, Catherine Monpère, Hannah McGee and Hugo Saner
17. Lifestyle Management for Patients With Coronary Heart Disease - by Houston Miller,
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19. Essential of Cardiopulmonary physical therapy – Hillegass and Sadowsky.
20. Text book of Chest, Heart and Vascular Disorders for Physiotherapists – Downie Bros.
21. Cardiopulmonary physical therapy – Irwin and Tecklin – Mosby
22. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics, 4e (Physiotherapy Essentials)by Jennifer A. Pryor, Ammani S Prasad.

Advance Physiotherapeutics in Cardiovascular Medical and Surgical Conditions

MPTC 302 T

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 302 T	Advance Physiotherapeutics in Cardiovascular Medical and Surgical Conditions	6		6	96	20	80	100

COURSE OBJECTIVES AND OUTCOMES:

Given a real life situation, student will be able to establish and document an appropriate physical therapy examination, evaluation, diagnosis, prognosis and intervention including procedures for obtaining appropriate referral to, and assistance from other members of the healthcare community. Student will be able to understand and integrate the implications of anatomy, physiology, exercise physiology, and risk factors on the client problems and apply the Therapeutic Principles and Practice in Cardiovascular Rehabilitation

On completion of this course the student will be able to follow a Stepwise screening model for differential diagnosis that includes past medical and surgical history, risk factor assessment, clinical presentation, associated signs and symptoms, and review of symptoms. Student will also learn professional skills to do the Fundamental Assessment of Cardiovascular Conditions independently to address issues during independent practice or as a partof an organisations.

Students will be able to use this information and enhance his skills in planning and tailoring effective, specific, safe Physiotherapy treatment programmes and work collaborativelyin group settings.

Course Outcome: This course also provides the basis of assessment and management of disorders of the medical and surgical conditions related to Cardiovascular system and enhance the skills in planning and tailoring effective, specific, safe Physiotherapy treatment programmes and work collaboratively in group settings.

MODULE I

Fundamental Clinical evaluation and assessment of cardiovascular dysfunction. Following are the considerations in assessments, to be done for the medical and surgical conditions like: Ischaemic Heart Disease, Congenital heart diseases, Acquired heart disease, Coronary artery disease, Pulmonary and Systemic Hypertension, Orthostatic Hypotension, Diseases of the myocardium, Pericardial disease, Tumors of the heart, Peripheral Vascular Disorders, Disorders of Cardiac Rate, Rhythm and Conduction and ECG interpretation, Cardiac Arrest, Cardiac Failure,Shock, Rheumatic Fever, Diseases

of the Heart Valves, CPCR, Heart Disease, In Pregnancy, Degenerative Arterial Disease, Inflammatory Arterial Disease, Diabetes, and Amputation. Hemodynamic Performance of CTVS Patients, A-V Shunt, Incisions and Procedures on Sternum, Chest Wall, Diaphragm, Mediastinum, Oesophagus

Skills of physiotherapeutic function, measurement and documentation, SOAP format, History taking, Cardinal signs, Inspection, Palpation, Percussion, Auscultation relevant to cardiopulmonary sciences Basic principles and concepts of Multisystem assessment and laboratory investigations and Outcome measures including but not limited to:

Respiratory and Cardiovascular stress test & Ergometry; Cardiac Catheterization & Coronary angiography.

Functional performance assessment- 2MWT, 3MWT, 6MWT, 12MWT, modified shuttle test, step test, other Quality of life measures.

Respiratory muscle fatigue, and Respiratory muscle training- Assessment, training methods in health and disease and with implications in elderly and children.

Scales used in Cardiac rehabilitation: Becks Depression Inventory (BDI) and Hamilton AnxietyScale (HAS); mini-mental state examination, SGRQ, CRQ, SF-36, CAT, etc.

Functional evaluation: Functional assessment and outcome scales and questionnaires. Evaluation Methods, Special tests, and Scales used in Musculoskeletal, Neurological, and Cardiopulmonary disorders

MODULE II

Clinical Application of Physiotherapy Techniques in medical and surgical conditions: General Concepts and Advanced Treatment Strategies for Cardiovascular Conditions like: CTVS Procedures: Outline And Definition Of Procedures, Differences in Open and Closed Heart Surgery, Extra-Corporeal Circulation: Techniques, Cardiopulmonary Bypass: Pathophysiology And Introduction To OPCAB, LV Assist Devices. Recent Advances Like MIDCAB, OPCAB, Heart-Port, Heart Transplant, Recent Advancements, and Medical Robotic Surgeries

Complications of Cardiac Surgery (Thrombo-Embolism in Brain, Lungs and Distal Vessels, Phrenic Nerve Injuries, Unstable Sternum and Implication of Procedures like Omentoplasty, Etc.)

Airway Clearance: Percussion, Vibration, Shaking, Quick Stretch, Postural drainage, Huffing & Coughing, Suctioning procedure, Manual hyperinflation, Facilitating airway clearance with coughing techniques: Cough pump, Complications, Cough evaluation, Assisted coughing techniques, Active cycle of breathing, Autogenic Drainage, Glossopharyngeal, Breathing, Pursed Lip breathing, relaxed breathing, segmental breathing, indications and CI for each technique, Positive expiratory pressure, High -frequency chest wall oscillation, Intrapulmonary Percussive ventilation, Acoustic airway clearance.

Body positioning: Prescriptive versus routine body positioning, Physiological effects of various body positions, Physiological effects of frequent changes in body position, Prescription of therapeutic body positions and body position changes, Mechanical body positioning,

Ventilatory facilitatory techniques, Vibratory PEP Devices: Acapella, Flutter, Non-Vibratory PEP Devices: Thera PEP, Respiratory muscle training, Physiotherapy to increase lung volume, Lung expansion therapy, Incentive spirometry, CPAP, IPPV.

Physiotherapy to decrease the work of breathing: Handling breathlessness, Relaxed positions, relaxation, Breathing re-education, Exercise and pacing, Intermittent compression for lymphatic disorders, Burgers Exercise, Oxygen therapy and humidification, oxygen toxicity, Nebulization, Aerosol therapy

Recent advances in the techniques used for treatment and rehabilitation.

Physiotherapy after Surgical Management of the Conditions, Indications, Contra-Indications, Preoperative Assessment of Patients in case of Elective surgery, procedure and Precautions before and after Surgery. Also Included but not limited to:

Hemodynamic Performance of CTVS Patients, A-V Shunt, Incisions and Procedures on Sternum, Chest Wall, Diaphragm, Mediastinum, Oesophagus

CTVS Procedures: Outline And Definition Of Procedures, Differences in Open and Closed Heart Surgery, Extra-Corporeal Circulation: Techniques, Cardiopulmonary Bypass: Pathophysiology And Introduction To OPCAB, LV Assist Devices. Recent Advances Like MIDCAB, OPCAB, Heart-Port, Heart Transplant, Recent Advancements and Medical Robotic Surgeries

Complications of Cardiac Surgery (Thrombo-Embolism in Brain, Lungs and Distal Vessels, Phrenic Nerve Injuries, Unstable Sternum and Implication of Procedures like Omentoplasty, Etc.)

Module III Physiotherapy in ICU

Anaesthesiology

Anesthesia: types, benefits, effects on cardiopulmonary system, complications, Post-operative atelectasis: types, pathogenesis, and management.

Hemodynamic monitoring: Methods, Instrumentation, Clinical Application and Stabilization of Vital Function. Monitoring systems and Defibrillators subclavian lines & chest tubes.

Intensive Care Unit and Emergency care

Investigative Techniques & Radio diagnostics and Principles of pathological investigations and imaging techniques related to cardiovascular disorders with interpretation & analysis of: Blood test and blood biomarkers and its clinical significance, Arterial Blood Gas (ABG) analysis, and other biochemical examination. Common complications in ICU, Transfer and turning of the patient

CPR and emergency management strategies in the ICU

Suggested Reading:

1. General Surgery. Bailey And Love
2. Hurtz: The Heart
3. Principles And Practice Of Medicine. Davidson
4. Harrison's Principles Of Internal Medicine. Braunwald, Fauci, Kasper
5. Guidelines for Pulmonary Rehabilitation Programs-by AACVPR
6. Principles and Practice of Cardiopulmonary Physiotherapy. D Frownfelter, E Dean
7. ACSM'S Guidelines for Exercise Testing and Prescription
8. Fundamental Principles Of Exercise Physiology - For Fitness, Performance, AndHealth – Robert A. Robergs And Scott O. Roberts.
9. Advances in Cardiopulmonary Rehabilitation - by Jobin, Jean,
10. Advancing the Frontiers of Cardiopulmonary Rehabilitation - by Jobin, Jean.
11. Exercise Prescription- by Swain, David P,
12. Clinical Exercise Physiology - by Ehrman, Jonathan.
13. Guidelines for Cardiac Rehabilitation & Secondary Prevention Program,– AACVPR
14. AACVPR Cardiac Rehabilitation Resource Manual, AACVPR
15. Heart Disease and Rehabilitation - by Pollock & Schmidt
16. Cardiovascular Prevention and Rehabilitation - by Joep Perk, Helmut Gohlke, Irene Hellemans, Philippe Sellier, Peter Mathes, Catherine Monpère, Hannah McGee and HugoSaner
17. Lifestyle Management for Patients With Coronary Heart Disease - by Houston Miller,

18. Textbook of general medical and surgical conditions for physiotherapists – Downie Bros.
19. Essential of Cardiopulmonary physical therapy – Hillegass and Sadowsky.
20. Text book of Chest, Heart and Vascular Disorders for Physiotherapists – Downie Bros.
21. Cardiopulmonary physical therapy – Irwin and Tecklin – Mosby
22. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics, 4e (Physiotherapy Essentials) by Jennifer A. Pryor, Ammani S Prasad.

COMPUTER SKILL PROGRAMING

MPTC 303T*

Course Objectives:

The students will be able to appreciate the role of Computer technology. The course has focus on computer organization, computer operating system and software, and MS Windows, word processing, excel data worksheet and PowerPoint presentation.

Module I
Introduction to computer: Introduction, characteristics of computer, block diagram of computer, computer languages.

Module II
Input output devices: Input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision input devices), output devices (monitors, pointers, plotters, screen image projector, voice response systems).

Module III
Processor and memory: The central Processing Unit CPU, Main memory.

Module IV
Introduction of Operating System: introduction, operating system concepts, types of operating system. History of Windows, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows opening, closing, moving, resizing, minimizing and maximizing etc. and install different software.

Module V
Introduction to MS Word: Complete menu of the MS-word, Basic shortcut keys for MS- Word

Module VI
Introduction to excel: Introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs, macron, tables, basic formulas/ Functions (Sum, count, average, logical operators), forting and filteration, Gridlines, Merge, basic short cut keys for MS- Excel.

Module VII
Introduction to PowerPoint: Introduction, creating and manipulating presentation, views, formatting and enhancing text slide with graphs.

Module VIII
Internet and its applications: Definition, brief history, basic services email, File transfer protocol, telnet, the World Wide Web (WWW), www browsers, use of the internet. Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

Reference Books:
1. Fundamentals of computer by V. Rajaraman, Neeharika Adabala
2. Computer Fundamentals by Anita Goel
3. Introduction to computer Science: a textbook for beginners in informatics by Gilbert Brands

CLINICAL NUTRITION

MPTC 304T*

Course objectives: Upon completion of the course the student shall be able to understand the need and importance of proper nutrition. The student will have better understanding of biochemical and clinical manifestations, preventive and therapeutic measures of the nutrition-related disorders.

Course outcomes: The students will be able to identify wrong nutrition prescriptions if any. The students will have increased knowledge regarding the care needed to prevent or treat the disease condition.

Module I: Introduction to Nutrition:

- Food Groups 1.2Food Pyramid
- Fundamentals of Meal Planning 1.4Concept of Food Exchange List
- Assessment of Nutritional Status

Module 2: Therapeutic adaptations and types of diets

- Therapeutic adaptations of a normal diet and modes of feeding.
- Different types of diets and methods of feeding patients
- Enteral Feeding-Indications for use and complications of enteral feeding.
- Parenteral Feeding- Indications for use, advantages and complications.

Module 3: Etiology, Prevention, and Dietary Management in Disease of Cardio-vascular system:

- Atherosclerosis
- Hyperlipidemia
- Hypertension
- Ischemic Heart Disease

Module 4: Etiology, Prevention and Dietary Management in Metabolic Disorders:

- Diabetes:
    - Incidence and predisposing factors
    - Symptoms-types and tests for detection
    - Metabolism in Diabetes
- Dietary treatment & meal management
    - Uric Acid Metabolism:
    - Gout
    - Metabolism in Gout
    - Signs and Symptoms
    - Dietary Treatment and Management
    - Errors of Metabolism: Metabolic defect, symptoms and management:
    - Gluten Enteropathy
    - Lactose Intolerance
    - Phenylketonuria
    - Homocystinuria

Text Books/References Book:

1. Robinson & Lawler, 1986, Normal and Therapeutic Nutrition, 17th edition, Mac Millan Publishers.
2. Mahtab S. Bamji, N Prahlad Rao, Vinodini Reddy, 2017, Text Book of Human Nutrition, 2nd edition, Oxford & IBH Publishing Co. Pvt. Ltd
3. B Srilakshmi, 2017, Dietetics, 7th edition, New Age International Publishers
4. Kumud Khanna, Sharda Gupta, Santosh Jain Passi, Rama Seth, Ranjana Mahna & Seema Puri, 2016, Textbook of Nutrition and Dietetics,2nd edition, Phoenix Publishing House (P) Ltd.

Cardiovascular medical and Surgical conditions
MPTC 301 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 301 P	Cardiovascular medical and Surgical conditions		2	1	32	10	40	50

Course Description: The course covers topics related to assessment, diagnosis and management of Cardiovascular medical and Surgical conditions

Course Objective: The course should enable the student to acquire in-depth understanding and skill in understanding of assessment, diagnosis and management of Cardiovascular medical and Surgical conditions.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in the subject.

1. Student must be demonstrated different conditions with patients.
2. Evaluation of condition subsequence.

Advance Physiotherapeutics in Cardiovascular Medical and Surgical Conditions
MPTC 302 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 302 P	Advance Physiotherapeutics in Cardiovascular Medical and Surgical Conditions		4	2	64	10	40	50

Course Description: The course covers topics related to assessment, diagnosis and management of Advanced Physiotherapy techniques in Cardiovascular medical and Surgical conditions**.**

Course Objective: The course should enable the student to acquire in-depth understanding and skill in understanding of assessment, diagnosis and management of Physiotherapy techniques in Cardiovascular medical and Surgical conditions**.**

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in the subject.

1. Student must be demonstrated different conditions with patients.
2. Evaluation of condition subsequence.

Evaluative Clinical Practice- III
MPTC 305 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPT C 305 P	Evaluative Clinical Practice- III** (Based on Viva, Case presentation from clinical postings)		18	9	288	50	50	100

Course Description: The course covers topics related to assessment, diagnosis and management of Cardiovascular and Pulmonary Conditions. The student will make a case presentation amongst the cases he/ she would have handled during clinical postings.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in assessment, diagnosis and management of Cardiovascular and Pulmonary Conditions.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in assessment, diagnosis and management of Cardiovascular and Pulmonary Conditions.

Case presentation on the basis of patient seen during clinical postings

Introduction to Research Dissertation

MPTC 306 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 306 P	Introduction to Research Dissertation		6	3	96	10	40	50

Course Description:The course covers topics related to scientific writing.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in scientific writing.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in writing and scientific writing. They should be able to prepare the review of literature of the dissertation work. The student will be able to:

Seminar on Scientific Writing Based on Literature Search of given Project Work to

1. Identify the specific headings
2. Create theoretical frame work of area of study
3. Maintain details of available information of area of study
4. Learn referencing styles
5. Learn reference managing soft wares
6. Learn to avoid Plagiarism

4thSemester

Bioethics and Hospital Administration
MPTC 401 T*

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC* 401	Bioethics and Hospital Administration	4	-	4	64	20	80	100

Course Description: The course covers topics related to physiotherapy ethics, clinic management.

Course Objective: On completion of the course the student should be able to understand the basic issues of physiotherapy management & administration and practice as an informed professional on Legal & ethical issues.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics and clinic management.

I. Administration

1. Functions of management
2. Fundamentals of hospital administration
3. Management Process – Planning, Organization, Direction, Controlling, Decision making
4. Personnel Management – Staffing, Recruitment Selection, Performance appraisal, Job satisfaction.
5. Total Quality management – basics, quality control, quality assurance

II. Hospital management

1. History of hospital Administration, Planning, and designing supportive services
2. Planning and designing ancillary and medical services
3. Financial / Management of a hospital
4. Planning and designing administrative services
5. Marketing of a hospital
6. Management of the hospital
7. Planning and developing a hospital (emphasis on physiotherapy department)
8. Administrative running of a hospital
9. Organization of a hospital

III. Bioethics & legal issues

1. Rules of Professional Conduct
2. Legal responsibility
3. Role of International health agencies
4. Standards of practice for physiotherapists
5. Liability and obligations in the case of medical legal action
6. Law of disability and discrimination
7. Confidentiality of the Patient's status
8. Consumer Protection Law, Health law, MCI, DCPTOT
9. Regulations of State Professional Councils (DCPTOT, MCPTOT, HCPTOT, GCPTOT and CGCPTOT)

Essential Readings:

1. Human Resource Management by NK Singh
2. Public Power & Administration by Wilenski, Hale & Iremonger
3. Physical Therapy Administration & Management by Hickik RobertJ
4. Medical ethics & consumer protection act by S K Singhal

Suggested Readings:

1) Managerial accounting for hospital by American Hospital Association
2) Hospital: planning, design & management by G D Kunders

PEDAGOGY

MPTC 402T*

COURSE OBJECTIVES AND OUTCOMES:

To instill pedagogy skills in Physical Therapist to effectively conduct teaching learning and clinical-based education and training

Course Outcome: This course will enhance the ability of the Physiotherapist to implement the principles of management & administration in the context of increasing interaction between the healthcare facility & the community and also instill pedagogy skills in the student.

Course Description:

MODULE I

Pedagogy

a) **Introduction to Education and Emerging Issues in Education**

b) **Concepts of Teaching & Learning**

- Meaning need & scope of educational psychology
- Meaning & relationship between teaching & learning
- Learning theories
- Dynamics of behavior, Individual differences
- Bloom's taxonomy of instructional objectives
- Preparation of unit plan & lesson plan
- Concept of Microteaching

c) **Curriculum**

- Meaning & Concept of Curriculum
- Basis for curriculum formulation/development.
- Framing objectives for a curriculum
- Process of curriculum development (including fieldwork)
- Factors Affecting Curriculum Development
- Evaluation of curriculum

d) **Teaching Learning Methods** :

- Lecture, lecture – demonstration, discussion, seminar, assignment, project method and case study method
- Introduction and brief on Blended Teaching Learning methods, SAMR model withapplication to online platform and tools.

e) **Teaching Aids**

- Types of teaching aids
- Principles of selection
- Preparation and use of audio-visual aids

f) Continuous & Comprehensive Evaluation:

- Nature of educational measurement: meaning, process & types of testing

- Construction of an achievement tests & its analysis, Standardized tests, Introductionof some standardized tools and important tests of intelligence, aptitude and personality
- Diagnostic, Formative and comprehensive evaluation.

ENTREPRENEURSHIP

MPTC 403T*

COURSE OBJECTIVES AND OUTCOMES:

This course will help a student to develop knowledge and skills for Commercialisation and Entrepreneurship as a whole for health-related enterprise and personnel training and resource allocation, investment, venture and innovation and to be able to provide rational justification for equity-centred national development to demonstrate effective citizenship.

Course Outcome: To enhance the potential of the Physical Therapist to become an effective communicator especially in the context of education.

Module I

Theories and models of health care improvements, innovation, and entrepreneurship foridea development and idea feasibility analysis

a. Healthcare economics and reimbursement, Behavioural economics
b. Advances in digital health and health information technology.
c. Accelerators, incubators, and other startup resources, Role of angel, seed, and venturecapital investors
d. Patents and the fundamentals of intellectual property
e. Inter-professional collaboration and teamwork, Change management and Diversity
f. Application of TOMA (Top of the mind awareness)
    - Awareness & guidance to the common people about health & disease and available professional services.
    - Patient education and Education of health care practitioners
    - Use of media in clinical education

Suggested Reading

1. Basic Management. Trivedi
2. Principles of Marketing : Philip Kotler
3. Human Resource Management by NK Singh
4. Public Power & Administration by Wilenski, Hale & Iremonger
5. Physical Therapy Administration & Management by Hickik Robert J
6. Principles of Education – Soti Shivendra Chandra and Rajendra K. Sharma
7. Philosophical Foundation of Education – Srinibas Bhattacharya
8. Sociological Foundation of Education – Srinibas Bhattacharya
9. Revitalizing classroom Entrepreneurship Education: Adopting a crit
ical approach in theedited by Karin Berglund, Karen Verduyn
10. Entrepreneurs: Talent, Temperament and Opportunity: John Thompson
11. Handbook of clinical teaching- Watts naney, Churchill Livingstone.
12. Pedagogy Physiotherapy Education: CS Ram
13. Communication skills in Clinical Practice- Sethuraman K.R.
14. Developing a Pedagogy of Teacher
education: Understanding teaching and learning aboutteaching by J. John
Laughran
15. Handbook of Technological pedagogical content knowledge (TPC
K) for educators byMary c. Herring
16. Language, Culture and community in Teacher education by Maria Estela Brisk.

Dissertation
MPTC 404 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 404 P	Dissertation	-	18	9	288	60	140	200

Course Description: The course covers carry out an independent research, which will involve conducting of the work as per the documented methodology, data collection, statistical analysis, dissertation writing. The work will build on the knowledge acquired through study of research methodology and biostatistics.

Course Objective: The course should enable the student to acquire in-depth knowledge and skill in independent dissertation writing.

Course Outcome: Students should be able to develop a research project and conduct the dissertation writing independently in physiotherapy.

The student will submit the synopsis/ proposal duly signed by the guide.
The student will have to submit the progress report time to time as notified by the School.
Once the permission is taken from the guide the student will have to submit the copies (notified by the department in the prescribed formats with all relevant documents and soft copy in CDs.)
After the submission the student will undergo the final viva except in unusual conditions.

Evaluative Clinical Practice- IV
MPTC 405 P

Subject Code	Subject	Hrs/Week		Credits	Total Teaching hours	Examination (Marks)		
		Th	Pr			Internal	External	Th
MPTC 405 P	Evaluative Clinical Practice- IV** (Based on Viva, Case presentation from clinical postings)	-	18	9	288	20	80	100

Course Description: The course covers topics related to assessment, diagnosis and management of lower quadrant neuro musculoskeletal sports injuries and athletic training planning.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in assessment, diagnosis and management of lower quadrant neuro-musculoskeletal sports injuries and athletic training planning.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in assessment, diagnosis, and management of lower quadrant neuro-musculoskeletal sports injuries and athletic training planning.

Case presentation on the basis of patient seen during clinical postings